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Chinch Bugs

HOW TO CONTROL THEM

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U. S. DEPARTMENT OF AGRICULTURE

CHINCH BUGS • How To Control Them

Chinch bugs feed by sucking juice from plants that belong to the grass family.

One species (*Blissus leucopterus*) damages barley, wheat, rye, oats, corn, and sorghum throughout the central and eastern regions of the United States and in the Southwest (Texas and Oklahoma). Heavily infested plants wilt and die.

In the East another species (*Blissus hirtus*), called the hairy chinch bug, infests lawn grasses and the turf of some golf courses. In Florida a third species (*Blissus leucopterus insularis*) is the most troublesome of the insect pests attacking St. Augustine grass in lawns; it also damages golf courses. Yellowish spots appear on lawns or turf infested by chinch bugs. The spots turn brown when the infested grass dies.

Most chinch bug injury is caused by the young bugs, or nymphs.

The bugs produce at least two generations a year. The nymphs of each generation must have food plants in which there is a considerable flow of sap. In regions where field crops are attacked, migration from one crop to another is common. Preventing migration of nymphs from small grain to corn or sorghum is an important phase of chinch bug control.

APPEARANCE

The different species of chinch bugs look much alike.

A newly hatched bug is about half the size of a pinhead. At first it is bright red, and has a white band across the back. At this stage it is called a red nymph.

As the bug grows, it sheds its skin, or molts, five times. Each time it becomes darker. After the fourth molt it is practically black, and has a white spot on the back between the wing pads. It is then called a black nymph.

After the fifth molt the insect has wings. It is now an adult. It is about $\frac{1}{6}$ inch long, and is black with white markings.

NOTE.—A picture sheet showing the adult chinch bug, the red nymph, and the black nymph in natural color has been published by the Department of Agriculture. The species shown is *Blissus leucopterus*. The sheet is published to assist farmers in identifying the chinch bug. If you wish a copy, write to the Office of Information, U. S. Department of Agriculture, Washington 25, D. C. Ask for Picture Sheet No. 27.

HOW THEY LIVE

In the Central and Eastern States and in Texas and Oklahoma, adult chinch bugs hibernate in shelters formed by grass, leaves, and litter. Bunchy perennial grasses (such as bunchgrass, prairiegrass, and broomgrass) and clump-forming grasses (such as timothy, purpletop, and orchardgrass) are highly favored as winter quarters. The bugs hide deep down in the tufts of these grasses. Large numbers also hibernate under leaves and litter at the edges of woodland, under hedges, and in fence rows.

Sometime between February and late in May—usually after a day or two of warm, sunny weather—the spring flight occurs: The bugs fly from their winter quarters and settle in fields where they find their preferred food plants.

In cultivated areas in the Central and Eastern States chinch bugs usually fly

Three of the five immature stages of the chinch bug: *A*, First stage (red nymph); *B*, second stage; *C*, fifth stage (black nymph).

to wheat, rye, or barley, then migrate to corn or sorghum. But if cool weather delays the flight, they may settle in oats or even fly direct to young corn or sorghum. In the Southwest, also, the bugs sometimes fly direct to corn or sorghum.

Soon after reaching the fields, the bugs mate. The females lay eggs behind the lower leaf sheaths of the plants, on the roots, or in the ground nearby. A female lays several hundred eggs at the rate of 15 or 20 a day. The eggs are about $\frac{1}{32}$ inch long. They are white at first, then gradually become reddish. They hatch into nymphs in 1 to 2 weeks.

Where the eggs hatch in fields of small grain, the nymphs and the old bugs feed on the grain plants until, as the grain ripens, the plants dry up. Then they migrate to a new feeding place—a field of young corn or sorghum if one is nearby. The old bugs usually migrate first. They fly to the new crop, and die soon after reaching it. The nymphs that they leave in the small grain are in nearly all stages of growth, but are wingless. They soon crawl to the new crop. Here they feed, mature, and mate.

The chinch bug: Winged adult.

The eggs of a second generation are laid on the corn or sorghum plants, or near them, and the second-generation

bugs feed on these plants. As the summer advances, the adults of the first generation of the growing season—they migrated from the small grain as nymphs—complete their egg laying and gradually die off. In the fall the second-generation adults fly to winter quarters.

In the Southwest the first generation develops earlier in the season than in the Central or Eastern States. Most of the bugs have wings by migration time, and fly to the new crop. Three generations usually develop.

In Florida chinch bugs feed throughout life on St. Augustine grass, and may produce three or more generations a year. They do most of their feeding when the grass is green and succulent. In northern Florida the adults hibernate. In the southern part of the State they are active in winter, except on the coldest days. Their usual winter shelter, in both parts of the State, is the dry grass collected about the roots of the growing grass.

CONTROL MEASURES

Chinch bugs are controlled by such cultural practices as growing nongrass crops, growing resistant grains, and planting corn and sorghum early; by stopping migrations with barriers; and by applying sprays and dusts.

Cultural Practices

Growing nongrass crops

In areas where chinch bugs of the first generation feed on small grains and those of the second generation on corn or sorghum, farmers can hold down the bugs' rate of buildup by reducing the food supply of one generation or the other.

If your farm is in an area where corn and sorghum are the leading crops, you can handicap the first generation of bugs by reducing the acreage of small grains. If small grains are the leading crops, you can handicap the second generation by reducing the acreage of corn and sorghum and planting legumes or other immune crops in their place.

The following crops are practically immune from chinch bug injury: (1) The legumes, such as clovers, alfalfa, vetch, lespedeza, soybeans, cowpeas, field peas, peanuts, and velvetbeans; (2) truck and garden crops, except sweet corn; and (3) sunflower, flax, rape, and buckwheat.

Legumes produce shade and dampness, which chinch bugs avoid. When they are planted among small grains and corn, the shade and dampness protect those susceptible crops. Try growing clover, alfalfa, or vetch among small grains, and soybeans or cowpeas among corn.

Plant nongrass crops next to fields of small grain.

Growing resistant grains

Some small-grain plants are less susceptible to chinch bug injury than others. If reducing the acreage of small grain is impractical, consider planting the less susceptible grains.

Chinch bugs prefer barley to other small grains. Do not plant spring barley when there is a prospect of chinch bug abundance. Winter barley is less of a risk. It can be harvested early in the spring before the first-generation bugs can do much injury.

Oats are more resistant to chinch bugs than wheat or rye. If other considerations make it feasible to do so, reduce the acreage of wheat and rye, and plant oats in their place.

Other practices

Chinch bugs tend to settle in the thinner or poorer parts of grain fields. They seldom do serious injury to heavy stands. Anything that can be done to produce thick, vigorous growth—such as timely seeding, ample fertilizer, and thorough tillage—reduces injury.

Plant strains of corn and sorghum that are resistant to chinch bug attack.

In the Southwest, plant corn and sorghum early. (Do not plant corn too

Chinch bug damage to border rows of a cornfield.

early, however, or the young plants will be injured by chinch bugs coming from their winter quarters.) Early planting of these crops is also advisable in other areas, except where the European corn borer is present.

Barriers

Farmers in the Central and Eastern States have used ground barriers for many years in controlling chinch bugs.

When placed along the edge of a field of infested small grain, a barrier prevents nymphs from crawling to an adjoining field of corn or sorghum at migration time. Several kinds of barriers are effective.

Barriers are of little value in the Southwest, because in that region the bugs develop earlier than elsewhere, and most of them migrate on the wing.

Dieldrin barrier

Entomologists at the University of Illinois have found that an excellent barrier can be made by spraying dieldrin at the rate of ½ pound per acre in strips between fields of small grain and adjoining fields of corn or sorghum.

Prepare a spray by mixing dieldrin emulsifiable concentrate with water. If you buy a concentrate that contains 1½ pounds of dieldrin per gallon, mix 3 pints of it (about ½ pound of dieldrin) with whatever amount of water you intend to use in spraying an acre. If the product you buy contains a lower or higher concentration of dieldrin, use proportionately more or less of it.

Spray a strip about 4 rods wide. Let half of the strip fall along the edge of the small-grain field and the other half along the edge of the crop that you want to protect. Then spray a strip 8 or 10 rods long and about 2 rods wide across each end of the main barrier—the long strip that runs between the fields. The short strips prevent bugs from going around the ends of the barrier.

Apply the spray a few days before the bugs begin to migrate. You can estimate the migration time by watching the condition of the small grain on which the bugs are feeding. The bugs begin to migrate when the plants begin to dry up.

All along the barrier, crawling bugs are killed by contact with the insecticide.

Apply the spray with a ground sprayer or by airplane. If you use a ground sprayer, equip it with drop nozzles and point the spray at the lower portions of the plants.

A dieldrin barrier is effective 7 to 14 days—long enough to stop a moderately heavy migration. Repeated spraying may be necessary to cope with an exceptionally heavy migration, or to renew a barrier destroyed by rain.

Other barriers

You can make good barriers in other ways.[1]

Make a dirt-ridge creosote barrier as follows:

1. Throw up a ridge of earth with a plow. Turn the dirt toward the crop to be protected.
2. Apply a line of coal-tar creosote, which is a repellent, along the brow of the ridge.
3. Dig a number of post holes in the furrow.

The bugs are trapped in the holes, where they can be killed easily with a little kerosene.

A paper-fence barrier is made by setting upright in the ground a 4-inch-wide strip of heavy paper (such as single-faced corrugated paper, or tarred felt paper) that has been soaked in creosote, and digging post-hole traps along the barrier on the side toward the small grain.

A dust containing DDT or a dinitro compound makes an effective barrier. Such a barrier kills bugs that come in contact with it.

Sprays and Dusts

Insecticides are useful in barriers, but it is impractical to apply them as sprays or dusts to large crop acreages for the purpose of reducing chinch bug infestations.

They can be used to advantage, however, on parts of a corn or sorghum crop and on lawns and golf courses.

On corn or sorghum

If border rows of corn or sorghum are invaded before you make a barrier, you will find it worth while to wipe out the limited infestation with an insecticide. Apply toxaphene, dieldrin, or nicotine sulfate to the base of the plants, where the bugs congregate. Coat the bugs with a dust or wet them with a spray.

Chinch bugs feeding on cornstalk.

TOXAPHENE.—Apply at the rate of 2 pounds of toxaphene to the acre. Use 20 pounds of a 10-percent dust, or 10 pounds of a 20-percent dust, or prepare a spray.

To prepare a spray, mix an emulsifiable concentrate or a wettable powder with water. How much of the concentrate or powder you must use to obtain the required dosage per acre depends on the amount of toxaphene in the product you buy; follow the directions

[1] Detailed instructions for making barriers other than dieldrin barriers are contained in Farmers' Bulletin 1780, How To Fight the Chinch Bug, which is superseded by this leaflet. Copies of the bulletin will be furnished on request as long as there is a supply. If you wish a copy, get one from your county agent, or write to the Office of Information, U. S. Department of Agriculture, Washington 25, D. C.

on the label. The amount of water you add depends on the per-acre output of your spraying equipment.

DIELDRIN.—Apply at the rate of ¼ pound of dieldrin to the acre. Prepare a spray. If you are using an emulsifiable concentrate that contains 1½ pounds of dieldrin per gallon, mix 1½ pints of it with 10 or more gallons of water. This gives you the amount of spray you need to treat 1 acre.

NICOTINE SULFATE.—To prepare a spray, dissolve ½ ounce of nicotine sulfate (40-percent nicotine) and 1 ounce of soap in 1 gallon of water. Use the spray in whatever amount is needed.

On lawns and golf courses

For control of chinch bugs in lawns, entomologists at the Connecticut Agricultural Experiment Station recommend the application of chlordane or DDT dust at the rates shown below.

Dust	*Pounds per 1,000 square feet*
5-percent chlordane	5
10-percent DDT	5–6

For control of chinch bugs in the turf of golf courses, they recommend the application of chlordane, in an emulsion spray, at the rate of 4 pounds of chlordane to the acre. To prepare a spray, mix an emulsifiable concentrate with water. How much of the concen-

Bunchy perennial grasses form shelters in which chinch bugs hibernate.

trate you must use to obtain the required dosage per acre depends on the amount of chlordane in the product you buy; follow the directions on the label. The amount of water you add depends on the per-acre output of your spraying equipment.

For control of chinch bugs in lawns of St. Augustine grass, Florida entomologists recommend the use of DDT in dry weather and chlordane in the rainy season.

Use DDT in a 5-percent dust or in a spray, or chlordane in a spray. Apply the DDT dust at the rate of 3 to 5 pounds per 1,000 square feet. Apply the spray at the rate of 4 ounces of DDT or chlordane per 1,000 square feet. Sprays are more effective than dusts on thick-turfed lawns.

To prepare a spray (either insecticide), mix an emulsifiable concentrate or a wettable powder with water. How much of the concentrate or powder you must use to obtain the required dosage per 1,000 square feet depends on the amount of insecticide in the product you buy; follow the directions on the label. To prepare the amount of spray needed to treat 1,000 square feet, mix the required amount of insecticide with 10 gallons of water.

Whether you dust or spray, two or three applications at 10-day intervals may be necessary to bring the infestation under control.

If you dust a lawn when it is dry, wash the dust down into the grass thoroughly after application.

Dieldrin is also effective against chinch bugs in lawns. It is slow-acting and long-lasting. Apply it as a 5-percent granular formulation.

Rate of application: Lawns in Florida, 1 pound per 100 square feet; lawns elsewhere, 1 pound per 725 square feet.

Apply the insecticide uniformly with a lawn fertilizer spreader when the lawn is dry. Immediately afterward, drench the lawn thoroughly to wash the dieldrin down to the base of the grass plants and into the soil.

PRECAUTIONS

In general.—Most insecticides are poisonous to people and to animals. Store insecticides where children, pets, and livestock cannot reach them. Handle them with care. Follow all directions, and heed all precautions, on the labels.

Treated lawns.—Keep children and pets off treated lawns until the insecticide has been thoroughly washed off the grass and into the soil and the grass has dried completely.

Treated crops.—Do not feed small grains, corn, or sorghum treated with DDT, dieldrin, chlordane, or toxaphene to dairy animals or to animals being finished for slaughter. Do not pasture these animals on such crops treated with these insecticides.

Dieldrin barriers.—Do not harvest grain treated with dieldrin in the 7-day period following the spraying.

ADDITIONAL INFORMATION

Upon request, your county agent or your State agricultural experiment station will furnish additional information on chinch bug control. Recommendations vary according to locality. Ask about barriers, resistant strains of corn and sorghum, and insecticides.

This leaflet was prepared by the Entomology Research Branch, Agricultural Research Service. It supersedes Farmers' Bulletin 1780, How To Fight the Chinch Bug.

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